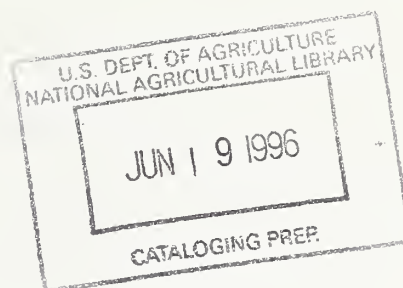


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**Exploring Consumers' Risk Perceptions of Recombinant Bovine Growth Hormone and
Recombinant Porcine Growth Hormone by Income and Gender:
A Focus Group Study**

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Executive Summary

The purpose of this focus group project is to explore how the participants perceived risk related to food products using two animal-specific food biotechnologies, recombinant bovine growth hormone (rbGH) and recombinant porcine growth hormone (rpGH). Three focus-group sessions, which explored the participants' beliefs about milk, were conducted in November 1994 in Benton County, Oregon. The focus groups also explored the participants' perceptions of risk factors toward rbGH-treated herd milk, and perceptions of rpGH-treated hogs. Three different focus groups were chosen to compare differences by gender and income. One group was composed of low-income women; the second group was composed of middle- to high- income women; and the third group was composed of middle- to high-income men.

Participants in all three groups expressed either no awareness or limited awareness of rbGH and rpGH. None of the women from the low-income group were aware of rbGH or rpGH. Only a few of the middle- to high-income men and women were aware of these biotechnologies, about which the participants expressed concern. All three groups questioned whether these products were necessary. They were not convinced that the benefits of biotechnology outweighed the perceived costs.

The participants indicated strong beliefs about and images of milk. They discussed milk as a good, natural product. Women expressed the value of milk as nutritional for children. Men associated images of motherhood and babies with milk.

Through discussions about rbGH biotechnology, participants identified factors considered important to their risk perceptions of rbGH. These factors included: current and future health risks; distrust in government, industry, farmers, and the media; economic factors; labeling, information, and self-protection actions; environmental factors; health effects on cows; and processing uncertainties.

In general, participants were concerned about the rbGH product and its synthetic production. Participants mentioned the possibility of future risks; they were concerned that in five to ten years, the government would discover adverse health effects. They expressed feelings of distrust for the Food and Drug Administration (FDA), farmers, the media, and the company producing rbGH. Participants thought the FDA had not adequately tested the product before approval.

Participants were concerned with the economic aspects of rbGH. They did not believe the benefits of reduced prices would ever be seen by the consumer, because of existing milk surpluses and price supports. They were also concerned that the cow health issues would be secondary to the human health issues. The two women's groups spoke of both positive and negative environmental effects due to the use of rbGH.

Finally, there were participants who were interested in more information, who wanted labeling, and who recommended proactive measures or risk-averting behavior. Participants remembered some information from the time when rbGH first appeared on the market, but commented that rbGH was no longer considered newsworthy, and the issue had seemed to disappear from the media. They wanted information to help answer their questions, and thought it would be good to label milk from cows not treated with rbGH. The two women's groups discussed self-protections like substituting other products (for example, soy milk) for cow's milk, seeking information, reducing milk consumption, supporting proactive policy action, and purchasing untreated herd milk from a reliable source. The feelings about rbGH carried over into the discussion of rpGH. Participants believed there was less known about rpGH, and also questioned the need for this particular biotechnology.

The participants in this study expressed concern and questioned the necessity of these two biotechnologies. Although the men's and women's groups noted their concerns, the factors of risk perception they deemed important differed. The men talked more about the economic implications and the cows' health, whereas the women spoke of human health risks, and their uncertainties about the

testing and processing of milk. The low-income women were more adamant in their concern regarding rbGH than either of the middle- to high-income groups. They were also more interested in seeking information and taking proactive measures.

This study will describe in detail participants' beliefs about milk, and their perceptions of rbGH and rpGH. In conclusion, the findings will be evaluated for their usefulness in designing a survey instrument for a national study.

INTRODUCTION

One of the first animal-specific food biotechnology applications, recombinant bovine growth hormone (rbGH), an injection given to cows to increase their milk production, was approved for commercial use on February 4, 1994, by the Food and Drug Administration (FDA). To date, the scientific evidence suggests that there is no risk to humans who consume milk or meat from cows treated with rbGH (CAST 1993). Prior to the FDA's approval, numerous researchers explored the marketability of rbGH by investigating consumer acceptance and consumption patterns (Fine, Travis, and Associates 1986; McGuirk, Preston, and Jones 1992; Smith 1989; Hoban 1990; Hoban and Woodrum 1990; Slusher 1990; Douthitt 1991; Kaiser, Scherer, and Barbano 1992). However, now that rbGH is available in the market, few researchers have followed up on consumer attitudes. Recombinant porcine growth hormone (rpGH), another animal-specific food biotechnology, reduces fat content, an attribute that consumers may consider desirable. As of this writing, the FDA has not approved rpGH for commercial use.

For this study, three focus groups were conducted in the fall of 1994. (Focus groups are interviews which rely on group interaction. They are useful as a supplement to quantitative data and can assist in generating hypotheses and evaluating different study populations.) Our primary goal was to increase our understanding of how gender and income affect consumer perceptions of these two food-related biotechnologies. Previous research indicates that female food purchasers are more likely to perceive greater risk concerning rbGH than males (Fine, Travis, and Associates 1986; McGuirk, Preston, and Jones 1992; Hoban and Woodrum 1990; Grobe and Douthitt 1995). In general, women make the primary food-purchase decisions and thus they have the greatest impact on household food purchases. Therefore, it is important to understand how risk perceptions may or may not differ by gender. Second, there are inconsistencies in the literature on the effects of income on consumers' risk perceptions of milk from rbGH-treated cows (McGuirk, Preston, and Jones 1992; Grobe and Douthitt

1995). McGuirk, Preston, and Jones (1992) found that individuals with incomes in the \$20,000–\$50,000 range were the most worried about the long-term health effects of milk from cows treated with rbGH, and the most skeptical of the government's ability to evaluate or regulate biotechnology. They also found that individuals with annual incomes of \$10,000–\$20,000 were in favor of approving rbGH. Conversely, Grobe and Douthitt (1995) found low-income respondents were more apprehensive of milk from rbGH-treated cows than respondents in higher income brackets.

The main objectives of the focus group were:

- 1: To learn more about consumers' beliefs about and images of milk.
- 2: To explore what factors, if any, influence consumers' perceptions of the risks associated with milk from rbGH-treated herds.
- 3: To explore whether or not the perception of risk is greater for one biotechnology than the other, or if the perceptions of risk are similar for both biotechnologies.

Sample

A total of twenty-four Benton County residents participated in the focus groups. The sample consisted of three different groups chosen to compare differences by gender and income: a group of low-income women, another of middle- to high-income women, and a third group of middle- to high-income men. (A low-income men's group was not surveyed because of time and financial limitations.)

The low-income sample consisted of eight women who were receiving assistance through the Women, Infants, and Children (WIC) program. Individuals with incomes up to 185 percent above the federal poverty level are eligible for Oregon WIC benefits. The nine middle- to high-income women had annual total incomes greater than \$25,000. These women were affiliated with Oregon State University through volunteer activities or through their husbands' employment, but they were not

themselves wage earners at the university. Eight had adult children and one participant had a nine-year-old child.

The seven middle- to high-income men also had annual total income greater than \$25,000. Three worked at Oregon State University and four worked with local companies. One respondent had younger children. Two were not married.

Methods

The three focus groups, with from seven to nine participants per group, were conducted in Benton County, Oregon. Convenience sampling techniques were used to identify samples for the middle- to high-income men and women. Local community groups and businesses provided assistance (for example, announcing the need for participants at meetings and in newsletters) with soliciting participants. The low-income women's sample was acquired by seeking individuals who received Women, Infants, and Children (WIC) assistance. A poster in the waiting room of the county WIC office asked for volunteers to participate in a group discussion on food-related biotechnologies, which were described as a product given to cows to increase their milk production and a product given to hogs to increase their growth rate, resulting in leaner pork. All potential participants were to be their household's primary food shopper, but they did not need to be aware of either of the two biotechnologies. The authors were interested in the viewpoints of individuals with and without awareness or knowledge of the biotechnologies. The potential participants were also informed that they would receive a \$20 cash reimbursement for their time.

Each participant was sent a letter of invitation two weeks before the focus group session. The participants were asked to attend a 90-minute group discussion on two food product biotechnologies. The participants were reassured that they did not need to be aware of, or have heard about either of the biotechnologies, as information would be provided at the group discussion. The letter noted the time,

date, place, and a general format for the group discussion. Participants were reminded of the cash reimbursement they would receive at the conclusion of the session. The two middle- to high-income focus groups were held at the Family Study Center at Oregon State University, and the low-income focus group was held at a Benton County building.

Upon arriving at the focus group session, participants were asked to read and sign an informed consent indicating their willingness to participate in the group discussion, as well as their consent to be taped during the session. They were informed that the main reason for using the tape recorder was to verify the notes the moderator would take during the discussion. They were assured that the tape-recording would not be made public and that their comments, including direct quotes, would remain anonymous. All participants signed the informed consent form.

A moderator and an assistant moderator were present at all three sessions. The moderator's primary role was to guide and take notes on the discussion. The moderator wrote notes on large pads of paper at the front of the room; these were later used to summarize issues raised by the participants. Throughout the discussions, the moderator interrupted the participants only to clarify a speaker's word or phrase, and would repeat the question of interest during periods of silence or when the discussion went off track. The moderator did not answer the questions, but allowed participants time to answer or restate the question to the group for another participant to answer; some questions remained unanswered until the end of the session. The assistant moderator handled logistics, the tape recording, and recorded nonverbal communication between the participants.

The moderator began by introducing the project and with neutral background information on rbGH and rpGH. The information on rbGH included a diagram (see Appendix A) illustrating the processing of milk from rbGH-treated and untreated cows (Ropp 1994). The background information included these major points:

1. rbGH is a growth hormone produced by technology, and it can increase a cow's milk production;
2. the FDA approved rbGH after reviewing scientific evidence which indicates that humans who consume milk or meat from treated cows face no known health risks;
3. the FDA is not requiring mandatory labeling of milk from rbGH-treated cows;
4. the potential economic benefits;
5. the economic effects on farmers; and
6. the animal health effects

The moderator presented similar information about rpGH (see appendixes B and C for more detailed summaries).

After a brief question-and-answer session to clarify the background information, the moderator asked the participants about their beliefs and images of milk: "What are the first things that come to mind when you think of milk?" After a five-to-ten minute discussion, the moderator asked a similar question about rbGH. The discussions on rbGH lasted approximately one hour, with a five-minute recap, before focusing on rpGH.

Initial Beliefs about and Images of Milk

Overall, the participants had favorable beliefs (opinions) and images (mental pictures or representations) of milk. One middle- to high-income woman believed that milk is "good for you, the most complete natural product without any additives." Women from the low-income group described milk as "good for you," and noted that it is the "best source of vitamin D and calcium." Members of the men's group noted that milk is a nutritional product.

The two women's groups also talked about the function of milk in their diets; they asked, "how else would you eat your cereal?" These middle-income women described the ways milk can be used:

you can “pour milk on anything,” and you can “make many things from milk.” They expressed their preference for milk by saying it “tastes good” and that they “love milk.” Similarly, the low-income women talked about the benefits of milk to their children. One woman said, “My kids drink lots of milk. I like milk. They pour milk into their cereal, fruit, soup; they put milk in just about anything. My kids have enough milk that I often do not feel like I need to feed them anymore vitamin D or calcium if they have three to four cups of milk per day.” Another participant agreed, saying it was “wonderful to feed [your children] enough . . . calcium for the day.” The middle- to high-income women talked about milk in relation to the nutritional development of babies, describing how “pediatricians start with cow milk-based formula first” and saying that milk is a “baby’s only food for the first three to four months.”

Both the middle- to high-income men and women made adverse comments about milk’s fat content. One woman said, “I can’t drink the real thing anymore . . . there is too much fat.” Although many participants were drinking skim milk, they felt there was a difference in the quality of whole and skim milk. One mother stated that she “raised children on the thin, watery, blue stuff” (blue referring to the cap color).

The images the men associated with milk included motherhood and babies. They talked about milk as being part of our culture, describing it as a “constant—plain, white milk” and as “cold” and “cheap.”

FACTORS OF RISK PERCEPTION TOWARD RECOMBINANT BOVINE GROWTH HORMONE

Current Health Risks

In all the focus group sessions, the participants voiced concerns regarding the effect of rbGH on human health. The low-income women expressed the greatest concern. Although they readily

acknowledged their lack of understanding of hormones, these women questioned whether rbGH would affect the immune system, increase their chances of developing cancer, accelerate puberty in their children, or act like a steroid. They wanted to know if rbGH would be “considered a residue” in milk and how much of a residue rbGH would produce.¹ The men’s group asked if they should be concerned “about the antibiotics or the hormone in the milk?” The men also wanted to know which federal agency determined the acceptable level of residues, and whether there was a higher concentration of rbGH in the milk. Overall, the men questioned whether “there were risks associated with residues from the milk” of rbGH-treated cows.

The effects on children were a great concern to both the women’s groups, although the low-income women appeared more concerned, possibly because their children were still living at home. Several women expressed concerns about child development; one low-income woman noted, “Just like in human beings, growth hormones have different effects on us at different stages in life—I would be curious if there would be any chance that it [rbGH] could act as a hormone in my children?” Another woman from the lower-income group pointed out that “children have a lower body weight so they could have a higher concentration and a higher risk. They are growing and it makes a difference.” In a discussion about hormonal effects, a participant in the middle- to high-income women’s group stated, “I’m glad I don’t have any young children in my house right now.” In contrast, one woman from the low-income group said she was not worried about serving milk from treated cows to her children, since she assumed there would not be significant amounts of hormone in the milk from the treated cows. But another woman from the middle- to high-income group noted that “growth hormone affects something that is very important and of value to our young. I have real concerns of the additives that may pass along in the milk, and I don’t feel like anyone has convinced me otherwise.”

¹“Residue” was a term used in the diagram in Appendix A.

Future Health Risks

All participants expressed concern about the possibility of future health risks associated with the use of rbGH. "FDA approval does not mean no risk in the future, ten years down the road it may be harmful to human health," commented one of the men. Women from the low-income group said they felt like "guinea pigs" because they believed the product had not been tested for a sufficient number of years. In general, members of all the groups wanted to see more testing of rbGH.

In expressing concern about future risks, each group independently drew a parallel between rbGH and the tranquilizer drug thalidomide, which when approved for use in European countries, was promoted by its maker as "nontoxic, with no side effects, and completely safe for pregnant women" (Burkholz 1994). But pregnant women who took the drug during the first trimester gave birth to infants with severely deformed limbs. Focus group participants were most concerned with rbGH's unpredictable and potentially harmful side effects, which they feared could result in a health disaster like the thalidomide tragedy. They asked, "How can we know, we can't predict what direction the product will turn." The men's group discussed the "butterfly effect," a metaphor for the process of small initial effects creating large, unforeseen effects in the future. One man also talked about "unintended consequences."

Both the women's groups elaborated on their concerns. A middle- to high-income woman stated "anything that is new has a struggle." When one woman from the group asked if "we should be afraid," another replied that, at the very least, "we should be skeptical." A low-income woman had a different perspective. "It is easy to be scared about something that is new, people are scared of new things. . . . I think in general science is finding a lot of neat answers to problems. I wouldn't really hesitate to buy the milk." Another low-income participant made an analogy between rbGH and varieties of lower-acid processing tomatoes. Before scientists decided to develop new varieties of processing tomatoes, people did not need to sterilize canning jars because of the tomatoes' high acid

content. The new varieties of processing tomatoes have caused people to change their canning habits. Now these tomatoes have less acid, and although scientists “were trying to make a better product with science, they messed up the system for safety.”

“Simple things we come to trust get taken away” was the feeling about biotechnology in the low-income women’s group. They did not want alterations made to a product they saw as natural; rbGH was seen as interfering with the “natural order of things.” These respondents asked, “Do we really need to put extra chemicals into things?” They see biotechnology as altering nature in ways from “how God made the earth.” The low-income women were also the most adamant about not buying dairy products made from rbGH-treated cows, saying they did not “want it in me.” One said, “I can’t stand all the things that have gone on in the food supply—additives, preservatives.” Another woman viewed rbGH as “another round of unnatural foods getting into the works.” The low-income women were the most pessimistic about the future. They felt that “after a while there will be so many things in milk that it won’t really be milk, [you] can do it [produce milk] even without cows.”

Distrust in the Government, Industry, Farmers, and the Media

All three groups questioned the trustworthiness of the government, particularly the FDA. “I don’t trust the FDA,” “How many of you have faith in the FDA?” One of the greatest concerns with the FDA was the potential for mishaps in ten to twenty years. The low-income women remarked, “The FDA tells us things and then ten years later it is a different story.” The middle- to high-income women’s group noted “with too many products, we realize ten years after their use, cause potential health effects. We have become accustomed to the fact that we should be skeptical.”

All three groups discussed the amount of testing the FDA conducted on rbGH. Participants, especially the low-income women, asked numerous questions about the testing process.² Their questions

²These questions are addressed above, in the “Methods” section.

focused on testing standards: "Is the concentration of rbGH higher than when it occurs naturally in cows?" "What are the allowable residues in milk?" "Does every dairy have their own testing?" "I am concerned with the standards of testing—will standards change with rbGH use?" "Who is monitoring the testing?" "Is this something you could feel safe that there is absolutely no chance of residues in the milk or is there some chance?" The men noted that "FDA approval does not mean [there is] no risk [to people]." They too were concerned with how much testing had been done.

The low-income women questioned the trustworthiness of farmers. They wondered whether "a local dairy would tell the truth about using rbGH." They also questioned whether "a local dairy cooperative would be notified if other farmers were using [rbGH]." The middle- to high-income women also expressed distrust in farmers: "Do farmers get to choose the samples that are sent to the processors?"

The middle- to high-income women and men also expressed distrust of the media. The women questioned the objectivity of both the local newspaper and "CBS Evening News." "CBS's information is questionable." In general, the men "did not trust the press" because the press presents "biased information."

Economic Factors

Participants questioned the benefit of a decrease in milk prices and wondered "why is this [rbGH] necessary?" The low-income women did not feel the use of rbGH would "guarantee cheaper milk." One pointed out that with "dairy price supports, the price will never go down." "I thought there were dairy supports. They can't really say prices would go down. I feel like in the price-support deal, consumers never get the lower price, general prices don't go down." The one low-income woman who had positive remarks about biotechnology felt there must be financial benefits if farmers are using rbGH, because they face the additional cost of purchasing the product and managing the herd's health.

“They [farmers] must be able to produce more milk with fewer cows.” The middle- to high-income women asked, “Don’t we have surpluses of milk already?” They wondered whether there was any research showing that rbGH was economical, and whether “they [the company producing rbGH] were doing this because they can do it, or is there a good economic reason for it.”

The men asked, “Do we really need it in the first place.” “If we have a surplus of milk, why invest time and resources into a product that may not be needed.” One man talked of the economic implications of rbGH: “at this point in time, this country [has] surpluses [of] milk and the prices are already suppressed. The trend is one that would push more small farmers out of business into a more large factory-type production, which doesn’t seem like a good thing to me.” He continued:

“Automatically, do we assume that big production is better. As the price of milk drops there is more milk out there and demand is more stable, which makes the farmers have to raise more cows to make up the same volume. This in turn forces bigger production and more extremes from the cows, who are already so bred for production [that] it’s causing distorted animals, they produce far more milk than they ever did. Is that the way we want to treat these animals, for milk production machines?”

The men discussed the increased economic risk to farmers when a cow is out of production. They were concerned that farmers would “need to dump the milk because of residue detection, causing lower revenue and increased expense, as well as a cost increase to care for the cows.” The low-income women were also concerned about the farmers: “Farmers are hurt when their cows are out of production.” The middle- to high-income women asked whether reduced herds resulted in economic problems for farmers.

The men discussed rbGH’s market implications. They wondered if “two camps” would be created, one for milk from cows treated with rbGH and another for milk from untreated cows. One

participant pointed out that “if discrimination in the market exists and consumers aren’t willing to pay, this will ultimately affect the farmer.”

Labeling, Information, and Self-Protection

The topic of milk processing triggered many questions.³ The middle- to high-income women wondered if, under the new nutritional labeling law, milk producers would be required to put rbGH on the milk’s ingredient label. They were concerned with whether or not the concentration of rbGH would be higher than the natural occurring bGH, raising the overall concentration of the hormone in the cow. They also wanted to know “would the dairy cooperative be able to identify what farmer was using it [rbGH], would they have to tell them.” They wondered how farmers and dairy cooperatives collaborated to determine the contents of the milk. Both the low-income women and the men’s group wanted to know whether rbGH was being used in other countries.

All of the groups discussed the lack of rbGH labeling and information available to them as consumers. Most of the discussion within the two middle- to high-income groups concentrated on labeling. The low-income women were also concerned and interested in what they could do to act on their concerns.

The middle- to high-income women commented that there was information when rbGH first came out, but that then it disappeared. One said, “We don’t know enough about this [rbGH], we don’t have answers to this.” Some said they had searched for information at grocery stores, but the store managers could not tell them if their milk products were from cows treated with rbGH. One man remembered that a “local grocery store had milk labeled with rbGH with a slash through it indicating that the milk did not have the hormone, just for a couple of weeks and then the milk didn’t have it on anymore.” Another asked, “Why aren’t they being separated?” The men’s group thought an “untreated

³This discussion usually occurred after the diagram (see Appendix A) was presented.

with rbGH label” would be “good.” Another man wondered if consumers were educated about rbGH. He added, “it takes a lot of dedication to find out what ends up on your plate.”

Only the low-income women expressed interest in proactive measures, actions to avert risk. One was going to “call the supermarket to determine whether they have treated or nontreated herd milk,” another “wished I had more information.” One low-income woman was curious as to “how a consumer like me, who is not interested in having rbGH in my milk, asks the local dairy farmer whether they are using the hormone.” Another low-income woman requested the FDA’s address so that she could write and encourage them to label milk from rbGH and non-rbGH treated cows. The low-income women also discussed substituting cow’s milk with goat or soy milk and they mentioned not drinking milk at all or “having your own cow.” The only self-protection the middle- to high-income women discussed was to seek out a local dairy cooperative which they knew carried milk from untreated cows.

Environmental Factors

Only the women’s groups discussed possible environmental factors concerning rbGH-treated herd milk. The low-income women pointed out that the “hormone excreted in urine may get into the ground and eventually into the water.” The middle- to high-income women asked “with fewer cows, are they using it [rbGH] as an environmental issue, and are they using this as a strategy to sell [rbGH]?”

Cow Health Effects

All three focus groups expressed concern for the cows’ health; the middle- to high-income women and men discussed the topic the most.⁴ The low-income women wondered whether the cows

⁴One man was very knowledgeable about farm management practices.

were out of production if they were sick. One middle- to high-income woman asked, “If we put small farmers out of business and hurt cows, is it worth it?” Another woman in the same focus group pointed out that “cows given rbGH may stop producing it [natural bGH] on its own, like human estrogen.” This group also brought up the topic of mastitis (inflammation of the cow’s udder). One woman commented on the incidence of mastitis and the health of the cows, noting, “If, for example, one out of every ten cows have problems, then that destroys farmer profitability.” Another countered this, saying there were “lots of reasons for mastitis, may not be because of rbGH, may be the farm management practices.”

The middle- to high-income women wanted to know if “the growth hormone alters the cow’s own natural hormone production.” They also wanted to know how much of the hormone they themselves were getting, and whether there were differences between this hormone and the human growth hormone. They were interested in how much rbGH increased in the milk, if the milk was different, and how rbGH is made. “We don’t know how much more of rbGH the cow will be producing, whether it’s doubling, whether it’s minimal, whether it changes the cow’s production of rbGH.”

The men discussed ethical issues concerning animal rights. One man was particularly concerned about the fate of the animals: “What underlies this is the question, are we in implicit agreement that we don’t care about cows, they are just things, not anything but things, objects and that’s it? I don’t agree with that stance.” There was also discussion of how our culture’s development of new technology is ultimately controlling our choices. “Effects on cows will not be given much economic weight. As a culture, is this ultimately how we will make decisions about bioengineering?”

When encountering new uses of technology in the food supply, focus group participants seemed to rely on their past experiences and knowledge of, beliefs in, and trust in regulators, manufacturers,

and farmers to determine the riskiness of a product. The participants had multiple concerns, which contributed to an overall sense of uncertainty about the food-related biotechnology rbGH.

GENERAL FINDINGS ON RECOMBINANT PORCINE GROWTH HORMONE

We report our general findings on recombinant porcine growth hormone (rpGH), even though less discussion time was devoted to it. Participants' attitudes toward rbGH carried over into the discussion of rpGH. Participants asked questions similar to those about rbGH, focusing on the need to introduce another chemical into a food source.

The participants were concerned that we "know less about this [rpGH] than rbGH." The low-income women felt it was "scary to mess around with natural biology" and that the manufacturers of rpGH "couldn't reproduce [the hormone] exactly like it occurs naturally in hogs." They also felt the product was not needed because "if you feed the pig right, exercise them, they will be lean and produce leaner meat." Another woman said, "We have knives, just cut the fat off." One low-income woman who was more positive about rbGH was also more positive about rpGH: "It's potentially wonderful for people that do eat meat, however, is the meat going to be nutritional, is there going to be enough hormone to affect you? Could be an exciting new development."

The middle- to high-income women wondered if the FDA had checked to see if rpGH "is being collected in the muscle tissue that we eat." They felt consumers already need to be more careful with pork because of health safety concerns, and that we are "eating less beef and pork as a nation."

The men were also concerned and thought rpGH was different from rbGH because we "eat the meat directly from the pig who is being given the hormone." They thought the effects on consumers might be different than from rbGH. They wanted to know how the federal government "will test for

residues of rpGH.” One participant said “low-fat pork would be good.” Another asked, “Does it taste the same, is it healthier?” Others thought that “certain foods taste good because there is fat.”

In summary, these findings suggest that, while the rpGH product is considered a positive technology because of its reduced fat attribute, the focus group participants are skeptical of rpGH. In part, their attitude may stem from the earlier discussion of rbGH; the findings might suggest that these individuals are adverse to food-related biotechnology applications in general.

CONCLUSIONS

For this study, three focus groups were conducted to explore how the participants perceived the risks of two food-related biotechnologies. The information obtained through these focus groups is invaluable in strengthening empirical measures of the factors affecting risk perception, and in formulating concise survey questions for a national study.

The central goal was to better understand how gender and income affect the perceptions of risk associated with the food biotechnologies rbGH and rpGH. The differences in gender and income were evident in the factors stressed by the different groups. The men talked in greater detail about market implications, economic consequences, and the health effects of rbGH on cows; the women talked in greater detail about the human health risks, the effects of rbGH on children, environmental issues, and milk processing and testing. There was a difference in the degree of concern and sense of immediacy between the low-income women and the two middle- to high-income groups. The low-income group was more apprehensive about rbGH than the middle- to high-income groups. They spoke of proactive measures to avert their risk perceptions, and were concerned with their children’s welfare. Although these findings do not reflect one particular gender or income group as being more concerned, they do

indicate a different emphasis on the perceived risks of these biotechnologies, and warrant further investigation.

The participants' comments are helpful in clarifying quantitative measures of consumer risk perceptions about these biotechnologies. The discussions indicated that important factors to include in a survey instrument are: beliefs about milk, trustworthiness of food-related information sources, current and future discoveries of human health effects, proactive measures, locus of control, and group affiliation.

Participants indicated favorable beliefs about milk from cows not treated with rbGH, which may sensitize them to the characteristics of rbGH they perceive as being unnatural. The participants voiced distrust in the government, industry, farmers, and the media—those who are directly involved in rbGH regulation, production, use, or information dissemination. Participants also expressed concern about the current human health risks and the future discovery of human health risks associated with milk from rbGH-treated cows. However, it is difficult to decipher from these findings the extent to which concerns about health risks differ in the short run versus the long run. The women participants also spoke of self-protection, or behavior to avert their perceived risk. Among other protective measures, they discussed milk substitutes, reducing milk consumption, and searching for dairy cooperatives with a policy of processing milk from cows not treated with rbGH.

Although locus of control and group affiliation were not main factors in the discussions, these subjects did come up. A couple of the low-income women expressed feelings of helplessness in reducing the perceived risk of rbGH. One felt it was useless to worry about this product because there are so many other things to worry about, and she believed one would need to wait numerous years for the discovery of any adverse effects. Another felt it would be worthless to boycott milk because it is used in so many products. These comments suggest an overall sense of helplessness or feelings of pessimism which could impact risk perceptions. Another factor implied by the participants was a sense

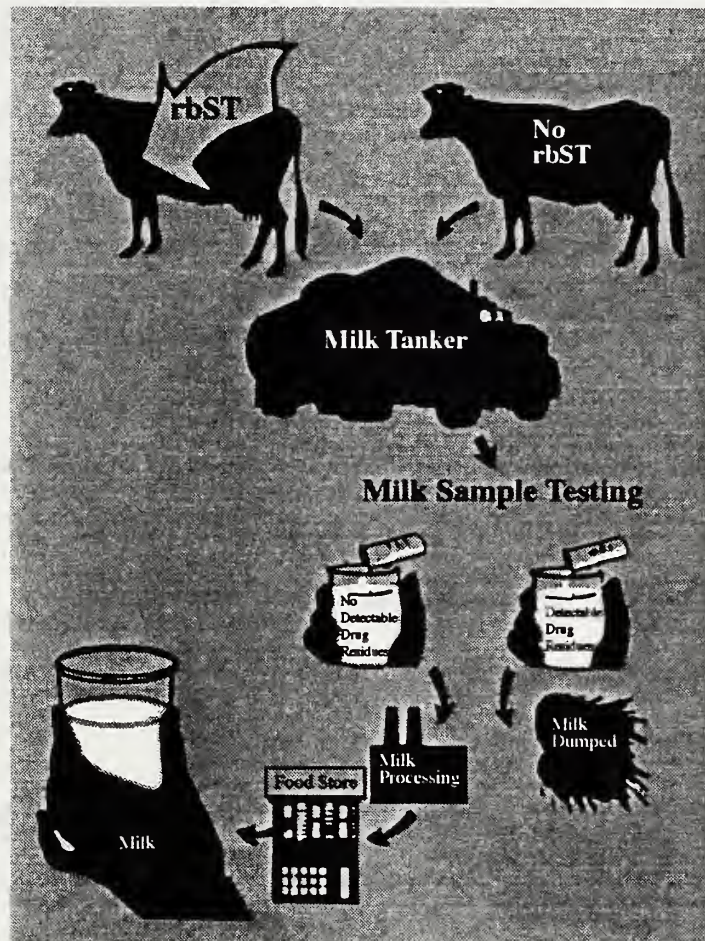
of affiliation with particular groups, which could be categorized as religious, environmental, and animal rights. Group affiliation may reflect personal values and provide insights as to one's risk perception of biotechnologies.

In addition, the findings suggest that a survey instrument designed to evaluate both biotechnologies—rbGH and rpGH—should consider the influence one biotechnology has on the other. Separate survey instruments could be designed for each biotechnology, or one survey instrument with the biotechnology questions in random order.

Appendix A

Processing of Milk Treated with rbST

Milk from rbST-treated and untreated cows is collected in the same manner. Milk from each farm is tested for antibiotic drug residues. If there are unsafe drug residues, the entire tanker of milk is dumped. If no residues are found the tanker delivers the milk to the processor who readies it for market. Antibiotics are used to treat mastitis, an inflammation of the cow's udder, which is more common in rbST-treated cows.



(Source: FDA Consumer, May 1994, p.26)

Appendix B

Information Provided to Participants Regarding Recombinant Bovine Growth Hormone (rbGH)

- rbGH is a growth hormone that is very similar to the bGH that is naturally produced by the cow, but is now produced by technology and can increase a cow's milk production.
- rbGH is sold to farmers by industry.
- After years of research, scientists concluded that there are no human health risks from consuming milk from cows treated with rbGH.
- rbGH was approved by the government's Food and Drug Administration in November 1993 and was available for sale in February 1994.
- The FDA is not requiring labeling of the milk that comes from rbGH-treated cows.
- Scientists are not able to find a nutritional difference between milk from treated cows and milk from cows that are not treated with rbGH.
- The reason for developing rbGH was to produce more milk from fewer cows.

I. One possible benefit of using rbGH may be a decrease in milk prices.

- Some organizations believe that if, given the use of rbGH, there is more milk, smaller farmers may not be able to compete and may go out of business.
- Researchers are still studying the health effects on cows (mastitis was given as an example) even though the FDA concluded that rbGH does not cause long-term health effects to treated cows or their offspring.

Appendix C

Information Provided to Participants Regarding Recombinant Porcine Growth Hormone (rpGH)

- rpGH is a growth hormone that is almost the same as the pGH that is naturally produced by the hog, but which is now produced by technology.
- rpGH is used to increase the growth rate of hogs.

II. The use of rpGH results in leaner pork. There is less fat.

III. The FDA has not yet approved rpGH.

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